GBG Australia

Some of our previous work

Stanwell Power Station, Downhole seismic investigation of compressive and shear wave velocities

Paul Klibbe (2006)

Hume Highway Duplication, Aulbury NSW, Seismic Refraction for large road cutting,

RTA (2006/2007)

Sydney Boathouse Development, Seismic refraction for proposed pile locations

Rozelle Bay Pty Ltd (2008)

Victoria Desalination Plant, Data interpretation of offshore seismic data

Parsons Brinckerhoff (2009)

Glenfield Junction Landfill, MASW survey to determine ground strength and locate rubbish dump

Aurecon (2009)

Berowra Railway Station, Refraction to determine fill depth for car park construction,

GHD Geotechnics (2009)

Liverpool Station, MASW to location Landfill below proposed construction

Aurecon (2009)

East Arm Warf, Darwin, MASW survey to locate voids in warf

Darwin Port Corporation (2009)

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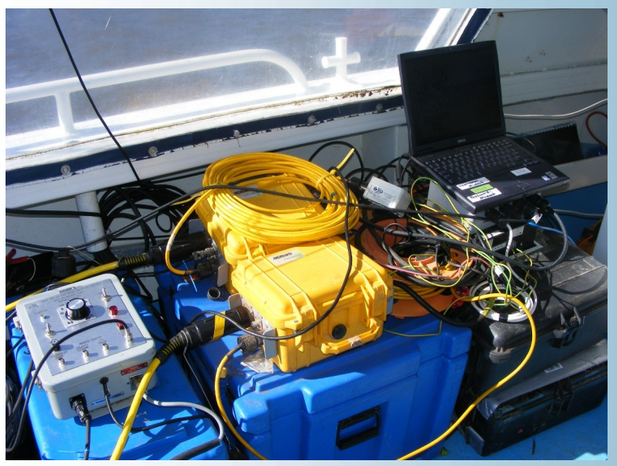
Non-destructive methods for

SEISMIC GEOPHYSICS

A number of methods are available to provide a means of obtaining information using seismic methods. Seismic methods greatly reduce costs as they provide a continuous image of the subsurface. This means a much greater coverage than bore holes can manage, reducing the number of bores needed. GBG Australia is committed to using the best technique to provide our clients with the most accurate and cost effective investigations.



Seismic Geophysical Services

- Seismic Reflection
- Seismic Refraction
- Multichannel Analysis of Surface Waves (MASW)
- Down-hole and Cross-hole Seismics
- Marine Seismic methods:
  - Reflection
  - Refraction
  - Single channel subsurface reflection
- Data processing of any privately collected data

For further information on our services, please visit our web-site:
www.gbgoz.com.au

GBG Australia

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Engineering Applications for

SEISMIC GEOPHYSICS

GBG Australia

GBG Australia is a specialist in applying non-destructive investigative techniques for the investigation of the subsurface. We offer our clients innovative methods of providing useful structural and engineering information whilst minimising both costs and disturbances to the site. Our techniques assist in targeting further tests or assist in the calculation of costs.

Company Profile

GBG Australia is a subsidiary of the GBG Group, a multi-national company specialising in the application of geophysical and advanced applied physics for precision investigations of geotechnical, environmental sites and engineered structures in UK and Europe since 1982. GBG has had a presence in Australia since 1993 originally through a joint venture with CMPS&F and GHD before becoming a stand alone company in 2003, operating in three main areas of business: geotechnical and environmental investigations; non destructive investigation of structures and contracting of equipment and staff for data collection, processing and interpretation of data.

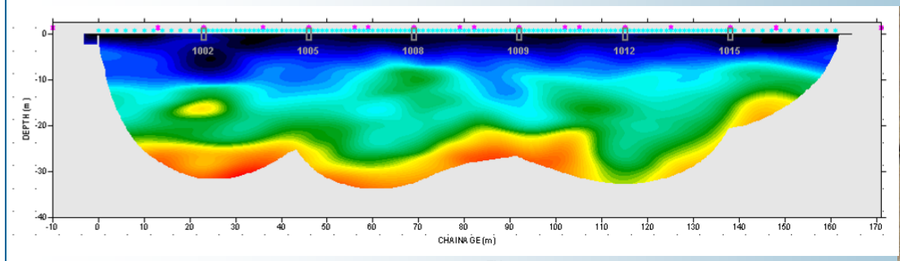
GBG Australia is an independent provider of non destructive and shallow geophysical investigation services with applications ranging from the location of a single pre-stressing strand in a concrete slab to mine scale exploration geophysics. With clients ranging from Local to Federal Government, and from developers and engineering companies to private individuals, we can provide tailored solutions to your particular subsurface investigation requirements.

Applications for

Seismic Geophysics

GBG Australia has considerable experience in a number of seismic techniques such as Seismic Reflection and Refraction, Marine Seismic applications and a relatively new technique: Multichannel Analysis of Surface Waves (MASW).

GBG Australia is proficient in all steps of the seismic process from data collection to interpretation. With a variety of seismic sources (including a weight drop and two air guns) GBG are equipped to perform a survey at whatever scale you require. We possess a suite of the latest seismic processing software that allows for quicker, more accurate and more informative results than ever before. Our new topographic imaging software allows any survey to generate precise geotechnical information of engineering value.



Seismic Refraction profile created using RAYFRACT™ Seismic Refraction Tomography Software

Seismic Refraction

GBG Australia is equipped with a large variety of seismic sources: from hammer sources to drop sources, air guns, down-hole sources and explosives, we are experienced in finding the best source to suit your site.

GBG is fully equipped with all the seismic collection equipment required to perform a survey. We own all our own geophones, cables and have a Geode: the latest in seismograph technology from Geometrics. We also own a down-hole four-component receiver. Our land streamer makes collection quick. Whatever your scope, GBG has the equipment to do the job.

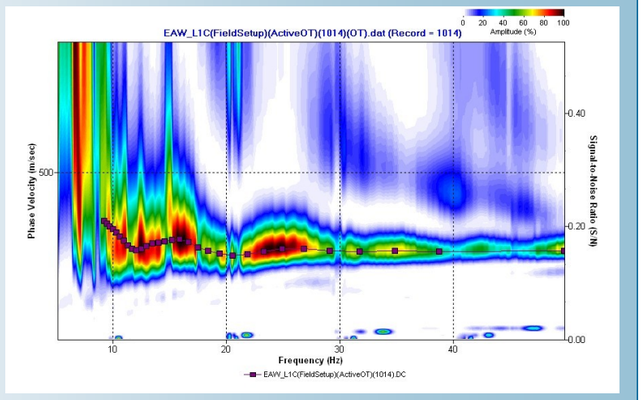
GBG Australia has the latest technology in refraction processing software (REFRACT 2008 developed by the RTA and RAYFRACT developed by intelligent Resources Inc.). Results used to only be able to image layers of increasing velocity with depth. Now with tomographic raytracing software a regular seismic survey can image objects of high velocity (like boulders or floaters) in a fill material; or a area of low velocity (voiding or poor consolidation in construction materials, caves and sinkholes in rock and soils). This provides a much more detailed result than previously possible and a much clearer interpretation of the subsurface.

GBG Australia is one of only a few companies in Australia with in-house equipment for Marine Refraction Surveys to provide bedrock depths and strengths for geotechnical assessment. We have 2 Bolt Air gun sources and a number of bottom towed or static arrays which can be set up and combined to provide profile depth of 1 – 50m depth.

Multichannel Analysis of Surface Waves (MASW)

A relative newcomer to the seismic world is the technique of MASW. This technique is collected in a similar way to refraction methods where surface waves are generated with a typical seismic source and the movement of the ground is measured. The returned signal is analysed for frequency using a number of spectral analysis techniques.

Computer modelling software (SurfSeis2 from Kansas Geological Survey) utilised by GBG Australia analyses the response and provides a sounding showing shear wave velocity changing with depth. By gridding a number of soundings, a profile of shear wave velocity is generated. Shear wave velocity (Vs) is an elastic constant related to Young's Modulus. Vs can be correlated with ground strength and can therefore be used to calculate load-bearing strength of the subsurface. This capability makes MASW one of the best methods for providing real engineering information from depth.



Spectral analysis of a MASW sounding

Speed of acquisition depends on the desired resolution of a survey. The more soundings performed, the better the results. If multiple parallel profiles are collected, three dimensional datasets can be generated. One of the greatest benefits of MASW is that signal can be received from both active and passive sources. This means that areas with high levels of ambient noise can still be surveyed, where other seismic methods would be useless.